

CLAIMS

We Claim:

1 1. A system for identifying and classifying images,
2 comprising:

3 a training set comprising a plurality of sample image pose
4 normalized images;

5 means for inputting an input image to be classified or
6 identified and storing the input image;

7 an image pose normalizer for image pose normalizing the input
8 image to produce an image pose normalized input image;

9 means for comparing the image pose normalized input image to
10 each of the plurality of sample image posed normalized images; and

11 means for displaying at least one of the plurality of sample
12 images which most closely corresponds to the input image.

1 2. The system of claim 1, wherein said means for comparing
2 the image pose normalized input image to each of the plurality of
3 sample image posed normalized images comprises:

4 a Normalized Vector Difference (NVD) algorithm, for
5 determining differences between the image posed normalized input
6 image and the plurality of sample image posed normalized images.

1 3. The system of claim 2, wherein said training set
2 comprising a plurality of image pose normalized images is generated
3 from a training set including a plurality of sample images pre-
4 processed to remove effects of rotation and scale.

1 4. The system of claim 3, wherein said training set
2 comprising a plurality of image pose normalized images is further
3 generated by defining a region of interest in each of the plurality
4 of sample images and normalizing the region of interest for each of
5 the plurality of sample images.

1 5. The system of claim 4, wherein said training set
2 comprising a plurality of image pose normalized images is further
3 generated by converting an image representation for each of the
4 plurality of sample images from cartesian coordinates to polar
5 coordinates to produce a corresponding plurality of sample image
6 pose normalized image for each of the plurality of sampled images.

1 6. The system of claim 5, wherein said image pose normalizer
2 for image pose normalizing the input image comprises:
3 means for by processing to remove effects of rotation and
4 scale by defining a region of interest in the input image.

1 7. The system of claim 6, wherein said image pose normalizer
2 for image pose normalizing the input image further comprises:
3 means for normalizing the region of interest for the input
4 image.

1 8. The system of claim 7, wherein said image pose normalizer
2 for image pose normalizing the input image further comprises:
3 means for converting the input image representation from
4 cartesian coordinates to polar coordinates to produce an image pose
5 normalized input image.

1 9. A method for identifying and classifying images,
2 comprising the steps of:
3 generating a training set comprising a plurality of sample
4 image pose normalized images;
5 inputting an input image to be classified or identified and
6 storing the input image;
7 image pose normalizing, using an image pose normalizer, the
8 input image to produce an image pose normalized input image;
9 comparing the image pose normalized input image to each of the
10 plurality of sample image posed normalized images; and
11 displaying at least one of the plurality of sample images
12 which most closely corresponds to the input image.

1 10. The method of claim 9, wherein said step of comparing the
2 image pose normalized input image to each of the plurality of
3 sample image posed normalized images comprises the steps of:

4 determining, using a Normalized Vector Difference (NVD)
5 algorithm, differences between the image posed normalized input
6 image and the plurality of sample image posed normalized images.

501 11. The method of claim 10, wherein said step of generating
502 a training set comprising a plurality of image pose normalized
503 images comprises the step of:

504 generating, from a training set, a plurality of sample images
505 pre-processed to remove effects of rotation and scale.

506 12. The method of claim 11, wherein said step of generating
507 a training set comprising a plurality of image pose normalized
508 images further comprises the steps of:

509 defining a region of interest in each of the plurality of
510 sample images, and

511 normalizing the region of interest for each of the plurality
512 of sample images.

1 13. The method of claim 12, wherein said step of generating
2 a training set comprising a plurality of image pose normalized
3 images further comprises the step of:

4 converting an image representation for each of the plurality
5 of sample images from cartesian coordinates to polar coordinates to
6 produce a corresponding plurality of sample image pose normalized
7 image for each of the plurality of sampled images.

1 14. The method of claim 13, wherein said step of image pose
2 normalizing the input image comprises the step of:

3 processing to remove effects of rotation and scale by defining
4 a region of interest in the input image.

1 15. The method of claim 14, wherein said step of image pose
2 normalizing the input image further comprises the step of:

3 normalizing the region of interest for the input image.

1 16. The method of claim 15, wherein said step of image pose
2 normalizing the input image further comprises the step of:

3 converting the input image representation from cartesian
4 coordinates to polar coordinates to produce an image pose
5 normalized input image.

1 17. A method for identifying and classifying images,
2 comprising the steps of:

3 inputting an input image to be classified or identified and
4 storing the input image;

5 image pose normalizing, using an image pose normalizer, the
6 input image to produce an image pose normalized input image;

7 comparing the image pose normalized input image to each of a
8 plurality of sample image pose normalized images in a stored
9 training set comprising the plurality of sample image posed
10 normalized images; and

11 displaying at least one of the plurality of sample images
12 which most closely corresponds to the input image.

1 18. The method of claim 17, wherein said step of comparing
2 the image pose normalized input image to each of the plurality of
3 sample image posed normalized images comprises the steps of:

4 determining, using a Normalized Vector Difference (NVD)
5 algorithm, differences between the image posed normalized input
6 image and the plurality of sample image posed normalized images.

1 19. The method of claim 18, wherein the training set
2 comprising a plurality of image pose normalized images is generated
3 by:

4 generating, from a training set, a plurality of sample images
5 pre-processed to remove effects of rotation and scale.

1 20. The method of claim 19, wherein the training set
2 comprising a plurality of image pose normalized images is further
3 generated by:

4 defining a region of interest in each of the plurality of
5 sample images, and

6 normalizing the region of interest for each of the plurality
7 of sample images.

1 21. The method of claim 20, wherein the training set
2 comprising a plurality of image pose normalized images is further
3 generated by:

4 converting an image representation for each of the plurality
5 of sample images from cartesian coordinates to polar coordinates to
6 produce a corresponding plurality of sample image pose normalized
7 image for each of the plurality of sampled images.

1 22. The method of claim 21, wherein said step of image pose
2 normalizing the input image comprises the step of:

3 processing to remove effects of rotation and scale by defining
4 a region of interest in the input image.

1 23. The method of claim 22, wherein said step of image pose
2 normalizing the input image further comprises the step of:
3 normalizing the region of interest for the input image.

1 24. The method of claim 23, wherein said step of image pose
2 normalizing the input image further comprises the step of:
3 converting the input image representation from cartesian
4 coordinates to polar coordinates to produce an image pose
5 normalized input image.

1 25. A computer-readable media containing a series of program
2 instructions for controlling the computer for identifying and
3 classifying images, said program instructions comprising:

4 an instruction for an instruction for inputting an input image
5 to be classified or identified and storing the input image;

6 an instruction for image pose normalizing, using an image pose
7 normalizer, the input image to produce an image pose normalized
8 input image;

9 an instruction for comparing the image pose normalized input
10 image to each of a plurality of sample image pose normalized images
11 in a stored training set comprising the plurality of sample image
12 posed normalized images; and

13 an instruction for displaying at least one of the plurality of
14 sample images which most closely corresponds to the input image.

1 26. The a computer-readable media containing a series of
2 program instructions for controlling the computer of claim 25,
3 wherein said instruction for comparing the image pose normalized
4 input image to each of the plurality of sample image posed
5 normalized images comprises:

6 an instruction for determining, using a Normalized Vector
7 Difference (NVD) algorithm, differences between the image posed
8 normalized input image and the plurality of sample image posed
9 normalized images.

1 27. The a computer-readable media containing a series of
2 program instructions for controlling the computer of claim 26,
3 wherein the training set comprising a plurality of image pose
4 normalized images is generated by:

5 generating, from a training set, a plurality of sample images
6 pre-processed to remove effects of rotation and scale.

1 28. The a computer-readable media containing a series of
2 program instructions for controlling the computer of claim 27,
3 wherein the training set comprising a plurality of image pose
4 normalized images is further generated by:

5 defining a region of interest in each of the plurality of
6 sample images, and

7 normalizing the region of interest for each of the plurality
8 of sample images.

1 29. The a computer-readable media containing a series of
2 program instructions for controlling the computer of claim 28,
3 wherein the training set comprising a plurality of image pose
4 normalized images is further generated by:

5 converting an image representation for each of the plurality
6 of sample images from cartesian coordinates to polar coordinates to
7 produce a corresponding plurality of sample image pose normalized
8 image for each of the plurality of sampled images.

1 30. The a computer-readable media containing a series of
2 program instructions for controlling the computer of claim 29,
3 wherein said instruction for image pose normalizing the input image
4 comprises:

5 an instruction for processing to remove effects of rotation
6 and scale by defining a region of interest in the input image.

1 31. The a computer-readable media containing a series of
2 program instructions for controlling the computer of claim 30,
3 wherein said instruction for image pose normalizing the input image
4 further comprises:

5 an instruction for normalizing the region of interest for the
6 input image.

1 32. The a computer-readable media containing a series of
2 program instructions for controlling the computer of claim 31,
3 wherein said instruction for image pose normalizing the input image
4 further comprises:

5 an instruction for converting the input image representation
6 from cartesian coordinates to polar coordinates to produce an image
7 pose normalized input image.